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Original communication

Study of defence injuries in homicidal deaths – An autopsy study

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ABSTRACT

In order to determine specific patterns and distribution of defence injuries, this study was conducted on 121 homicidal deaths which showed defence injuries in 40 (33%) cases. Of these 40 victims, 72.5% were males and 27.5% were females. Maximum numbers of victims were in the age group of 20–29 years. In 70% of cases, more than one assailant was involved. It was found that in 77.5% cases, sharp weapons were alone used, whereas, in 10% and 12.5% of victims, blunt weapons and multiple (sharp and blunt) weapons, respectively, were used. Fatal wounds were seen most commonly on the head and neck region. In 42.5% of cases, defence injuries were seen on the right side only, whereas in 27.5% of cases both sides were involved. Victim's right forearm and hand were more commonly involved because these are nearest to the perpetrator and consistent with the preponderance of right-handed individuals in the population.

1. Introduction

Distinction between suicide, homicide or accident is a major issue for the forensic pathologist. The ratio of homicides to suicides from sharp weapon injury is reported to be 5:2. Scene investigation and autopsy are essential in discriminating between homicide and suicide. A complete knowledge of investigative findings (scene of death, topography, number and type of injuries and autopsy) is always needed for interpretation of unusual findings.[1] Wounds located at the head, limbs, hands, nape of the neck or back were predictive of a homicide, whereas wounds located solely at the anterior parts of the trunk, neck or forearms were predictive of a suicide. The presence of bone or cartilage wounds was predictive of a homicide and their absence was predictive of a suicide. A vertical longitudinal axis of stab wounds located at the anterior part of the trunk was predictive of a homicide, whereas a horizontal axis was predictive of a suicide. The presence of defensive or violence-associated traumatic wounds was predictive of a homicide.[2]

In general, the forensic evaluation of sharp force injuries in living and dead individuals follows the same morphologic principles. Still, there are some special features of sharp force injuries in the clinical context, which have to be considered as examination findings on the living are interpreted to differentiate between accidental origin, self-infliction or homicidal assault. These include the frequency and localisation of defence injuries, injuries of the perpetrator and artificial injuries, especially those inflicted for the purpose of insurance fraud.[3]

Defence injuries may occur when the victim raises the hands or arms for protection ('passive' defence injuries) or tries to seize the weapon or the attacker's weapon-holding hand ('active' defence injuries, defence injuries sustained on grasping the weapon).[4]

Defence wounds are injuries that are caused by the victim attempting to defend themselves and are typically seen on the arms and hands.[5] Rarely, defence wounds are found on the feet or legs.[6] In assaults of any kind, the natural reaction of the victims is to protect themselves. The limbs used for protection can themselves be injured and these defence wounds may be of considerable medico-legal significance, as they indicate the victim was conscious, at least partly mobile and not taken completely by surprise.[7] The defence injuries can be in the form of abrasions, contusions, lacerations, fractures and dislocations in the case of blunt weapon assaults and incised, stab and chop injuries in the case of sharp weapon assaults. The diagnosis of a defence injury is not an anatomic or pathologic one, but is actually a circumstance-dependent designation.[8] (Figs. 1–3).

The presence of defence injuries is justly considered as an important sign that an individual has been the victim of an assault.[9] Their pattern helps in reconstruction of crime scene. Hence, the

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Fig. 1. Unusual defence injury (chop wound) – over front and inner aspect of right forearm in one of the cases studied.

Fig. 3. Defence wound (incised wound) over lateral aspect of left palm.

present study is undertaken so as to find out the most vulnerable age group and sex incidence in homicidal deaths in which the defence injuries were found, to analyse the pattern of these defence injuries and an attempt is also made to correlate the site of defence injury to the site of fatal wound.

2. Material and methods

The present prospective study was conducted at the Department of Forensic Medicine M.S. Ramaiah Medical College, Bangalore, India, during the period from January 2006 to December 2010, a period of 5 years. All homicidal deaths due to fatal injuries brought to the department for medico-legal autopsy were included. Ethical clearance was obtained. Detailed information regarding the circumstances of crime was sought from the police, victim's relatives and friends and by visits to the scene of occurrence. Descriptive statistics for qualitative type of data was summarised using frequency and percentage.

3. Results and discussion

During the study period, from January 2006 to December 2010, 4211 medico-legal autopsies were conducted, of which homicidal deaths constituted 161 cases (3.8%). Homicidal deaths due to injuries accounted for 121 cases (75.6%) of total homicidal deaths. Amongst these homicidal deaths due to injuries, 40 (33%) cases showed defence injuries. In several autopsy studies, the incidence of defence injuries ranged between 37.1% and 49.5%. Significantly different figures (5.8–31.8%) were reported in studies conducted on a comparatively smaller number of cases or preselected material.[4] In a retrospective study, 118 sharp force fatalities were analysed which included 70 homicides, and covering a 22-year period from 1986 to 2008.[2]

Fig. 2. Unusual defence injury (chop wound) – over left 4th inter digital space extending to foot.

Of these 40 victims (Table 1), 72.5% were males and 27.5% were females since males are more aggressive in nature and into outdoor activities, making them vulnerable to being on the receiving end of aggression. Similar findings were observed in the studies conducted by Mohanty M.K of 54 victims, 85.2% were males and 14.8% were females.[10] In a similar study by Singh O. Gambhir, Gupta B. D., 35 cases (29.17%) showed the presence of defence wounds. Defence wounds were commonly seen in the male victims.[11] In contrast, some investigators observed defence injuries in female victims more often (54.5–79.0%) than in male victims (27.3–36.0%).[12]

The absence of defence injuries in the 0–9-year age group could be attributed to the inability and unawareness of the children as to what is happening around them and also only one case in the age group of 10–19 years. So also only one case after 59 years was observed, signifying the lack of power/inactiveness in either responding/warding off the attack or showing an interest to protect themselves and the highest incidence of defence wounds in the age group of 20–29 years (57.5%) (Table 1) per se is because of maximum number of homicides taking place in this age group as well as the individuals are active and well aware about the surroundings (happenings) and would expect to protect themselves or ward off or counter-attack hence sustaining defence injuries. Similar findings were observed in the studies conducted by Mohanty M.K., maximum numbers of victims were in the age group of 21–40 years.[10]

Table 1
Distribution of victims based on age and sex.

Sl No.	Age group (yrs)	Male	Female	Total	Percentage
1	0–9	00	00	00	00
2	10–19	01	00	01	2.5
3	20–29	15	08	23	57.5
4	30–39	09	01	10	25
5	40–49	02	00	02	5
6	50–59	01	02	03	7.5
7	60 and above	01	00	01	2.5
	Total	29	11	40	100

Table 2
Distribution of cases based on number of assailants.

Sl No.	No. of assailants	Number of cases	Percentage (%)
1	One	12	30
2	More than one	28	70

Table 3
Type of force used to inflict fatal injuries.

Sl No.	Type of force	No. of cases	Percentage (%)
1	Sharp	31	77.5
2	Blunt	4	10
3	Both sharp & blunt	5	12.5
	Total	40	100

In 57.5% of cases where the defence wounds were present, the assailants involved were more than one and in most of such cases there were multiple defence injuries. In 30% of cases, a single offender was involved and in most of such cases there was a single defence wound (Table 2).

In cases with defence injuries, 77.5% cases were due to sharp weapon injuries, 10% were due to blunt weapon injuries and 12.5% were due to multiple (sharp and blunt) weapon injuries. Defence wounds were most commonly found in sharp weapon injuries since deaths due to sharp weapon injuries are more common and also were premeditated. In deaths due to blunt weapon injuries, which are usually unpremeditated, assailants would take the victims by surprise by using the blunt weapon available at the scene of occurrence (Table 3). In a similar study it was found that in 57.4% cases, sharp weapons were used, whereas, in 11.1% and 31.5% of victims, blunt weapons and multiple weapons, respectively, were used.[10]

Since majority of the victims were right handed, in 42.5% of cases defence injuries were seen on the right side only, whereas in 27.5% of cases both sides were involved. But even in half of the (three cases) left-handed victims defence wounds were found on the right side of the body signifying the role of other factors, such as the position of the victim, the relative position of assailant and the victim at the time of attack. that is, if the victim is attacked from his right side the possibility of sustaining the defence wounds on the right side of the body is more irrespective of handedness of the victim and vice versa (Table 4). Bajanowski et al. found almost the same distribution of defence injuries on the right and left arms, although these results are based on a very small number of examined victims.[13] In 40.7% of cases defence wounds were seen on the left side only, whereas in 37% cases both sides were involved.[10] In another study since they did not have any information concerning the handedness of victims, yet three incised wounds noted on the right palm were considered as defence wounds. These injuries were present on the palms of the victims' hand when they tried to hold the knife blade before the final deep gash.[1]

Upper limb was the most common site of defence wound since most of the victims were in upright position sustaining the defence wounds while trying to ward off the attack or in an attempt to cover most vital parts such as head and chest. In majority of the cases, either palmar or dorsal aspect of the hand was involved followed by the forearm. In one case the victim had sustained defence wound to the right foot since he was lying on the ground. In 10 cases the victims had sustained multiple defence wounds distributed over both upper and lower limbs due to change of relative positions of the victim and the assailants. In two cases the victim had sustained defence wound on the back of chest since they tried to bend and protect their vital parts, namely head, chest and abdomen (Table 5).

Table 4
Location of defence wound.

Handedness of victim	Right side	Left side	Both sides of body	Total
Right handed	14	9	9	32
Left handed	3	3	2	8
Total	17	12	11	40

Table 5
Correlation of site of fatal wound & location of defence wound.

Site of fatal wound	Site of defence wound
Head & Neck	Upper limbs – 06 Lower limbs – 00
Chest	Upper limbs – 20 Lower limbs – 05
Abdomen	Upper limbs – 08 Lower limbs – 02 Others (Back) – 01
Combination of above	Upper limbs – 03 Lower limbs – 04 Others (Back) – 01

In 10 cases defence wounds were present in both upper and lower limbs. In cases where the fatal wounds were noticed on the head and neck, defence wounds were most commonly found on the upper limb, either as an attempt to cover the head or ward off the attack. In cases where the victim had fatal injuries on chest and abdomen, even the lower limbs had defence wounds which could be due to the victim sustaining such injuries while kicking off the attack or trying to cover his vital parts (chest and abdomen). Victim's left forearm and hand were more commonly involved[10] (Table 5).

4. Conclusion

- Homicidal deaths due to injuries constituted 75.6% of total homicidal deaths.
- In 77.5% cases, sharp weapons alone were used, whereas, in 10% and 12.5% of victims, blunt weapons and multiple (sharp and blunt) weapons, respectively, were used.
- Maximum number of cases occurred in the age group 20–29 years in both sexes constituting 57.5% of cases.
- In 57.5% of cases where the defence wounds were present the assailants involved were more than one.
- Defence wounds were most commonly found in sharp weapon injuries.
- In 42.5% of cases defence injuries were seen on the right side only, whereas in 27.5% of cases both sides were involved.
- Upper limb was the most common site of defence wound.
- In cases where the fatal wounds were located on the head and neck, defence wounds were most commonly found on the upper limb.
- In cases where the victim had fatal injuries on chest and abdomen, even the lower limbs had defence wounds.

5. Limitations

1. Study was confined to a particular area (Bangalore North).
2. The information about the victims and the circumstances were based on the history provided by the police, victim's relatives and friends and only in few cases scene of occurrence was visited and the photographs of scene of occurrence were taken.

Conflict of interest
The authors declare that there is no conflict of interest.

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Ethical approval

None.

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